

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

1. *(Currently Amended)* A connector seal device for connecting a branch pipe to a transverse opening of a main pipe, the connector seal device comprising:

 a hollow elastomer insert composed in part of a first material, the elastomer insert including:

 a flexible support collar; and

 a sealing wall region with an inside surface tapered in an insertion direction and having first locking ring zones and an outside surface adapted to fit a diameter of the transverse opening, wherein the first locking ring zones comprise a first plurality of ring-shaped teeth and ring-shaped grooves defining a saw-tooth shaped cross section; and

~~an outside surface adapted to fit a diameter of the transverse opening;~~

 a pipe union of a second material, the second material being harder than the first material, the pipe union including:

 an engagement end with an outside surface tapered in the insertion direction and being adapted to cooperate with the inside surface of the elastomer insert, the outside surface having second locking ring zones comprising a second plurality of ring-shaped teeth and ring-shaped grooves defining a saw-tooth shaped cross section ~~and being adapted to cooperate with the inside surface of the elastomer insert; and~~

 a socket end adapted to cooperate with the branch pipe,

 whereby when the elastomer insert is inserted in the insertion direction into the transverse opening and the pipe union is ~~inserted~~ pushed in the insertion direction into the elastomer insert, the first and second locking ring zones engage in the manner of ratchet teeth and the elastomer insert is expanded and pressed further against the transverse opening through the

continued displacement of the pipe union in the insertion direction.

2. ***(Currently Amended)*** The connector seal device as defined in claim 1, wherein the first locking ring zones ~~have a saw-tooth shaped cross section and~~ are composed of a third material, the third material being harder than the first material but softer than the second material.

3. ***(Previously Presented)*** The connector seal device as defined in claim 1, wherein the locking ring zones are provided with a sliding agent.

4. ***(Previously Presented)*** The connector seal device as defined in claim 1, wherein the tapered inside surface of the elastomer insert is adapted to form an end stop or assembly stop for the insertion of the pipe union.

5. ***(Previously Presented)*** The connector seal device as defined in claim 1, wherein when the pipe union is inserted into the elastomer insert, the elastomer insert and the pipe union are arranged substantially concentric, wherein a first centering section on the elastomer insert is arranged to cooperate with a second centering section on the pipe union.

6. ***(Previously Presented)*** The connector seal device as defined in claim 1, wherein the outside surface of the elastomer insert is substantially cylindrical and includes barb-shaped projections arranged to fit against the transverse opening during installation of the elastomer insert into the transverse opening in the insertion direction and block any movement of the elastomer insert counter to the insertion direction.

7. ***(Previously Presented)*** The connector seal device as defined in claim 1, wherein the sealing wall region of the elastomer insert is a tubular section with sufficient length

to cover a reinforced area of the transverse opening.

8. ***(Previously Presented)*** The connector seal device as defined in claim 7, wherein the outside surface of the elastomer insert is coated with an anti-corrosion agent and/or an adhesive, the anti-corrosion agent and/or adhesive being protected by a cover foil during storage and transport of the connector seal device, until just prior to installation of the connector seal device in the transverse opening.

9. ***(Previously Presented)*** The connector seal device as defined in claim 1, wherein the sealing wall region of the elastomer insert comprises at least one groove filled with a sealing agent adapted to be released during installation of the pipe union in the elastomer insert.

10. ***(Previously Presented)*** The connector seal device as defined in claim 1, wherein the support collar of the elastomer insert is composed of a harder material than the sealing wall region.

11. ***(Previously Presented)*** The connector seal device as defined in claim 1, wherein the support collar of the elastomer insert is adapted to fit the outer circumference of the main pipe.

12. ***(Previously Presented)*** The connector seal device as defined in claim 1, further comprising a second hollow-plug type elastomer insert composed in part of the first material, the second elastomer insert adapted to be inserted from an inside of the main pipe into the transverse opening; and a hollow press-on cone adapted to be inserted into the second elastomer insert, wherein the second elastomer insert and the hollow press-on cone include locking ring zones corresponding to those on the elastomer insert and the pipe union, respectively.

13. ***(Previously Presented)*** The connector seal device as defined in claim 12, wherein an engagement end of the hollow press-on cone includes a support flange adapted to fit against the support collar of the second elastomer insert.

14. ***(Previously Presented)*** The connector seal device as defined in claim 12, wherein the pipe union includes a pipe extension adapted to fit against a ring-shaped seal on the second elastomer insert or against the hollow press-on cone to form a seal.

15. ***(Previously Presented)*** The connector seal device as defined in claim 12, wherein the pipe union has a pipe extension and/or a separate connecting piece, so that it is adapted to form a force-locking connection with the hollow press-on cone.

16. ***(Previously Presented)*** The connector seal device as defined in claim 1, further comprising at least one rope of a sealing material that is capable of swelling.

17. ***(Previously Presented)*** The connector seal device as defined in claim 16, wherein the sealing material of the rope is configured to swell when it comes in contact with water.

18. ***(Currently Amended)*** The connector seal device as defined in claim 16, wherein the at least one rope of the sealing material is arranged ~~inside a~~ in at least one of the ring-shaped grooves ~~of at least one of~~ the first or second locking ring zones.

19. ***(Previously Presented)*** The connector seal device as defined in claim 1, further comprising at least one sealing element adapted to be activated by heat.

20. ***(Previously Presented)*** The connector seal device as defined in claim 19, wherein the sealing element comprises a material which increases in volume under the effect of heat.

21. ***(Previously Presented)*** The connector seal device as defined in claim 19, wherein the sealing element includes an electric resistance heater.

22. ***(Previously Presented)*** The connector seal device as defined in claim 1, further comprising at least one pressure sensor for detecting contact pressure on a part of the connector seal device when the connector seal device is installed in the transverse opening of the main pipe.

23. ***(Previously Presented)*** The connector seal device as defined in claim 22, wherein the at least one pressure sensor comprises several pressure sensors arranged uniformly spaced apart in a circumferential direction of a part of the connector seal device.

24. ***(Previously Presented)*** The connector seal device as defined in claim 22, wherein the at least one pressure sensor is arranged on or in one of the elastomer insert, the pipe union, or a hollow press-on cone.

25. ***(Previously Presented)*** The connector seal device as defined in claim 22, wherein the at least one pressure sensor is arranged on or in a ring-shaped seal.

26. ***(Previously Presented)*** The connector seal device as defined in claim 22, further comprising at least one transponder and/or data carrier for detecting, storing, and/or transmitting the contact pressure values measured on the part of the connector seal device.

27. ***(Previously Presented)*** The connector seal device as defined in claim 26, wherein the at least one transponder and/or data carrier is arranged on or in one of the elastomer insert, the pipe union, or a hollow press-on cone.

28. ***(Canceled)***

29. ***(New)*** The connector seal device as defined in claim 1, wherein each of the first ring-shaped teeth has a first conical surface inclined in the insertion direction, and wherein each of the second ring-shaped teeth has a second conical surface inclined counter to the insertion direction, whereby when the pipe union is pushed in the insertion direction into the elastomer insert, at least one first conical surface and at least one second conical surface contact and glide along each other until at least one of the first ring-shaped teeth and at least one of the second ring-shaped teeth mutually snap into the respective ring-shaped grooves.